

What is claimed is:

1. A polymeric coating composition for applying adherent film coatings to metallic substrates comprising a powdered coating material substantially uniformly dispersed within a polymeric binder comprising a host polymer and a bonding promoter to effect polymerization of said polymer and bonding promoter in situ after said coating composition has been applied to said metallic substrate.

2. A coating composition according to claim 1 wherein said powdered coating material is selected from the group consisting of ceramic powders, carbon powders, metallic powders and mixtures thereof..

3. A coating composition according to claim 2 wherein said host polymer is selected from the group consisting of poly(vinylidene-fluoride) homopolymers, poly(vinylidene-fluoride)-hexafluoropropylene copolymers, poly(vinyl pyrrolidinone, bis[3-(trimethoxysilylpropyl)]ethylenediamine, and N-(2-aminoethyl)3-aminopropyl-triethoxysilane polymers and mixtures thereof.

4. A coating composition according to claim 3 wherein said host polymer is a poly(vinylidene-fluoride)-hexafluoropropylene copolymer.

5. A coating composition according to claim 1 wherein said bonding promoter is selected from the group consisting of Bis(trimethoxysilylpropyl)amine, hepta(decafluoro-1,1,2,2-tetrahydrodecyl)triethoxy silane, bis[3-(trimethoxysilylpropyl)]ethylenediamine, and N-(2-aminoethyl)3-aminopropyl-triethoxysilane, and mixtures thereof.

6. A polymeric binder system for fabricating coatings on metallic substrates comprising a host polymer and a bonding promoter to promote polymerization of said polymer and bonding promoter in situ after said coating composition has been applied to said metallic substrate.

7. A polymeric binder system according to claim 6 wherein said host polymer is selected from the group consisting of poly(vinylidene-fluoride) homopolymers, poly(vinylidene-fluoride)-hexafluoropropylene copolymers, poly(vinyl

pyrrolidinone, poly(acrylonitrile), poly(phosphazine) and poly(methylmethacrylate) polymers and mixtures thereof.

8. A polymeric binder system according to claim 7 wherein said host polymer is a poly(vinylidene-fluoride)-hexafluoropropylene copolymer.

9. A polymer binder system according to claim 6 wherein said bonding promoter is selected from the group consisting of Bis(trimethoxysilylpropyl)amine, hepta(decafluoro-1,1,2,2-tetrahydrodecyl)triethoxy silane, bis[3-(trimethoxysilylpropyl)]ethylenediamine, and N-(2-aminoethyl)3-aminopropyl-triethoxysilane and mixtures thereof.

10. A method for applying an adherent film coating to a metallic substrate comprising forming a polymeric binder containing a host polymer and a bonding promoter, mixing the polymeric binder with a finely divided coating material, and spreading the so formed polymeric coating composition onto said metallic substrate while allowing cross-linking of the binder to occur in situ thereby achieving good adherence between said coating composition and said substrate.

11. A coating method according to claim 10 wherein said coating material is selected from the group consisting of ceramic powders, carbon powders, metallic powders and mixtures thereof.

12. A coating method according to claim 11 wherein said host polymer is selected from the group consisting of poly(vinylidene-fluoride) homopolymers, poly(vinylidene-fluoride)-hexafluoropropylene copolymers, poly(vinyl pyrrolidinone, poly(acrylonitrile), poly(phosphazine) and poly(methylmethacrylate) polymers and mixtures thereof.

13. A coating method according to claim 12 wherein said bonding promoter is selected from the group consisting of Bis(trimethoxysilylpropyl)amine, hepta(decafluoro-1,1,2,2-tetrahydrodecyl)triethoxy silane, bis[3-(trimethoxysilylpropyl)]ethylenediamine, and N-(2-aminoethyl)3-aminopropyl-triethoxysilane and mixtures thereof.

14. A film coating for a metallic substrate comprising a powdered coating material substantially uniformly dispersed

throughout a solid polymeric matrix composed of a mixture comprising at least one host polymer selected from the group consisting of poly(vinylidene-fluoride) homopolymers, poly(vinylidene-fluoride)-hexafluoropropylene copolymers, poly(vinyl pyrrolidinone), poly(acrylonitrile), poly(phosphazine) and poly(methylmethacrylate) polymers and mixtures thereof and a bonding promoter selected from the group consisting of Bis(trimethoxysilylpropyl)amine, hepta(decafluoro-1,1,2,2-tetrahydrodecyl)triethoxy silane, bis[3-(trimethoxysilylpropyl)]ethylenediamine, and N-(2-aminoethyl)3-aminopropyl-triethoxysilane.

15. A film coating according to claim 14 wherein said powdered coating material selected from the group consisting of ceramic powders, carbon powders, metallic powders and mixtures thereof.

16. A lithium battery electrode according to claim 15 wherein said powdered coating material contains carbon.

17. A lithium battery electrode according to claim 15 wherein said powdered coating material contains a lithium compound.